IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appln. No.:	10/063,840	:	Confirmation No.: 7974
Appellants:	Kishore C. Acharya et al.	:	Group Art Unit: 3737
Filed:	May 17, 2002	:	Examiner: Jung, William C.
Docket No.:	121800/GEM-0007	:	

For: A METHOD AND SYSTEM FOR ASSOCIATING AN EKG WAVEFORM WITH A CT IMAGE

January 10, 2006

Board of Patent Appeals and Interferences
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is GE Medical Systems Global Technology Company, LLC, as evidenced by an assignment document recorded on May 17, 2002, on Reel 012706, Frame 0750.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences known to Appellants, Appellants' legal representatives, or assignee that will directly affect, be directly affected by, or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF THE CLAIMS

Claims 1-30 are pending in the application and stand finally rejected. Claims 1-30, as they currently stand, are set forth in Appendix A. Appellants hereby appeal the final rejection of Claims 1-30.

IV. STATUS OF THE AMENDMENTS

No amendments have been filed subsequent to the final rejection dated May 3, 2005. All prior amendments have been entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Claims 1, 13, 23, 24 and 25, are independent claims. A summary of the subject matter presented in each of the independent claims involved in the appeal is provided with reference to the specification and drawings. It is understood that the reference to the specific embodiments in the specification and drawings is provided for reasons relating to this appeal and is not intended to limit the scope of the claims.

Claim 1

Claim 1 is directed to a method for associating EKG waveform data with computed tomography image data using a data synchronization scheme (300, Figure 5, Paragraph [0027]). The EKG waveform data (200, Figure 4, Paragraph [0022]) is generated using an electrocardiogram device (2, Figures 2 and 3, Paragraphs [0018] and [0023]). See also (302, Figure 5, Paragraph [0027]). A computed tomography imaging system (4, Figure 2, Paragraphs [0018] and [0023]) is operated so as to create the computed tomography image data (Paragraph [0024]). See also (306, Figure 5, Paragraph [0028]). An exposure marker-in signal (228, Figure 4, Paragraph [0025]) is communicated to the electrocardiogram device such that the exposure marker-in signal is associated with the EKG waveform data (Paragraph [0025]). See also (308, Figure 5, Paragraph [0028]). The computed tomography image data, the EKG waveform data and the exposure marker-in signal, are processed so as to correlate the EKG waveform data with the computed tomography image data (Paragraph [0026]). See also (312, Figure 5, Paragraph [0028]).

Claim 13

Claim 13 is directed to a medium encoded with a machine-readable computer program code for associating EKG waveform data with computed tomography image data using a data synchronization scheme (300, Figure 5, Paragraph [0027]) and (Paragraph [0033]). The medium includes instructions for causing a controller to implement a method according to the following (40, Figure 3, Paragraph [0032]). The EKG waveform data (200, Figure 4, Paragraph [0022]) is generated using an electrocardiogram device (2, Figures 2 and 3, Paragraphs [0018] and [0023]). See also (302, Figure 5, Paragraph [0027]). A computed tomography imaging system (4, Figure 2, Paragraphs [0018] and [0023]) is operated so as to create the computed tomography image data (Paragraph [0024]). See also (306, Figure 5, Paragraph [0028]). An exposure marker-in signal (228, Figure 4, Paragraph [0025]) is communicated to the electrocardiogram device such that the exposure marker-in signal is associated with the EKG waveform data (Paragraph [0025]). See also (308, Figure 5, Paragraph [0028]). The computed tomography image data, the EKG waveform data and the exposure marker-in signal, are processed so as to correlate the EKG waveform data with the computer tomography image data (Paragraph [0026]). See also (312, Figure 5, Paragraph [0028]).

Claim 23

Claim 23 is directed to a method for associating EKG waveform data with image data generated by an imaging system using a data synchronization scheme (300, Figure 5, Paragraph [0027]). The imaging system (4), electrocardiogram device (2) and object (14) to be examined are obtained (Figures 2 and 3, Paragraphs [0018] and [0023]). The object is associated with the imaging system and the electrocardiogram device (Figures 2 and 3, Paragraphs [0018] and [0023]). The image data and the EKG waveform data are processed using the data synchronization scheme, wherein the data synchronization scheme operates in accordance with the following (300, Figure 5, Paragraph [0027]). The EKG waveform data (200, Figure 4, Paragraph [0022]) is generated using an electrocardiogram device (2, Figures 2 and 3, Paragraphs [0018] and [0023]). See also (302, Figure 5, Paragraph [0027]). The imaging system (4, Figure 2, Paragraphs [0018] and [0023]) is operated so as to create the image data (Paragraph [0024]). See also (306, Figure 5, Paragraph [0028]). An exposure marker-in signal (228, Figure 4, Paragraph [0025]) is communicated to the electrocardiogram device such that the exposure marker-in signal is associated with the EKG waveform data (Paragraph [0025]). See also (308,

Figure 5, Paragraph [0028]). The image data, the EKG waveform data and the exposure marker-in signal, are processed so as to correlate the EKG waveform data with the image data (Paragraph [0026]). See also (312, Figure 5, Paragraph [0028]).

Claim 24

Claim 24 is directed to a system for associating EKG waveform data with computed tomography image data using a data synchronization scheme (Figures 2, 3 and 5, Paragraphs [0018] and [0027]) and (300, Figure 5, Paragraph [0027]). The system includes a gantry (16, Figures 2 and 3, Paragraph [0019]) having an x-ray source (18, Figure 3, Paragraph [0019]) and a radiation detector array (20, Figure 3, Paragraph [0019]), wherein the gantry defines an object cavity (24, Figure 3, Paragraph [0019]) and wherein the x-ray source and the radiation detector array are rotatingly associated with the gantry so as to be separated by the object cavity (Paragraph [0019]). An object support structure (22, Figure 2, Paragraph [0019]) is movingly associated with the gantry so as to allow communication with the object cavity (Paragraph [0021]). The system also includes a processing device having the data synchronization scheme (40, Figure 3, Paragraph [0021] and [0033]), wherein the data synchronization scheme operates in accordance with the following (300, Figure 5, Paragraph [0027]). The EKG waveform data (200, Figure 4, Paragraph [0022]) is generated using an electrocardiogram device (2, Figures 2 and 3, Paragraphs [0018] and [0023]). See also (302, Figure 5, Paragraph [0027]). A computed tomography imaging system (4, Figure 2, Paragraphs [0018] and [0023]) is operated so as to create the computed tomography image data (Paragraph [0024]). See also (306, Figure 5, Paragraph [0028]). An exposure marker-in signal (228, Figure 4, Paragraph [0025]) is communicated to the electrocardiogram device such that the exposure marker-in signal is associated with the EKG waveform data (Paragraph [0025]). See also (308, Figure 5, Paragraph [0028]). The computed tomography image data, the EKG waveform data and the exposure marker-in signal, are processed so as to correlate the EKG waveform data with the computer tomography image data (Paragraph [0026]). See also (312, Figure 5, Paragraph [0028]).

Claim 25

Claim 25 is directed to a system for associating EKG waveform data with image data using a data synchronization scheme (Figures 2, 3 and 5, Paragraphs [0018] and [0027]) and (300, Figure 5, Paragraph [0027]). The system includes an imaging system (4), an object (14) disposed so as to be communicated with the imaging system, wherein the imaging system

generates image data responsive to the object, and a processing device (40) having the data synchronization scheme (300) (see Figure 2, Paragraph [0018], and Figure 5, Paragraph [0027]), wherein the data synchronization scheme operates in accordance with the following (300, Figure 5, Paragraph [0027]). The EKG waveform data (200, Figure 4, Paragraph [0022]) is generated using an electrocardiogram device (2, Figures 2 and 3, Paragraphs [0018] and [0023]). See also (302, Figure 5, Paragraph [0027]). The imaging system (4, Figure 2, Paragraphs [0018] and [0023]) is operated so as to create the image data (Paragraph [0024]). See also (306, Figure 5, Paragraph [0028]). An exposure marker-in signal (228, Figure 4, Paragraph [0025]) is communicated to the electrocardiogram device such that the exposure marker-in signal is associated with the EKG waveform data (Paragraph [0025]). See also (308, Figure 5, Paragraph [0028]). The image data, the EKG waveform data and the exposure marker-in signal, are processed so as to correlate the EKG waveform data with the image data (Paragraph [0026]). See also (312, Figure 5, Paragraph [0028]).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-30 stand rejected under 35 U.S.C. §102(b) as being allegedly anticipated by Heuscher et al. (U.S. Patent No. 6,154,516, hereinafter Heuscher).

VII. ARGUMENT

Claims 1-30 are patentable under 35 U.S.C. §102(b) over Heuscher.

"A claim is anticipated only if ***each and every element as set forth in the claim*** is found, either expressly or inherently described, ***in a single prior art reference***." *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). Moreover, "***[t]he identical invention must be shown in as complete detail as is contained in the *** claim***." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989) (emphasis added. Furthermore, the single source must disclose all of the claimed elements ***"arranged as in the claim."*** Structural Rubber Prods. Co. v. Park Rubber Co., 749 F.2d 707, 716, 223 U.S.P.Q. 1264, 1271 (Fed. Cir. 1984) (emphasis added). Missing elements may not be supplied by the knowledge of one skilled in the art or the disclosure of another reference. Titanium Metals Corp. v. Banner, 778 F.2d 775, 780, 227 U.S.P.Q. 773, 777 (Fed. Cir. 1985).

Claims 1, 13, 23, 24 and 25

Independent Claims 1, 13, 23, 24 and 25, each include the limitation of: "...***communicating an exposure marker-in signal to said electrocardiogram device*** such that said exposure marker-in signal is associated with the EKG waveform data...".

Dependent claims inherit all of the limitations of the respective parent claim.

Here, Appellants claim a method, apparatus and system, that includes: 1) ***an exposure marker-in signal***; and, 2) ***communicating the exposure marker-in signal*** from the imaging system ***to the electrocardiogram device.***

The Examiner alleges that Heuscher anticipates the claimed invention. Final Action Paper No. 26042005, pages 3-4.

In support of this alleged anticipation, the Examiner states that Heuscher anticipates the limitation of "communicating an exposure marker-in signal to said electrocardiogram device such that said exposure marker-in signal is associated with the EKG waveform data", by stating, "Examiner would like to point out that Heuscher et al. anticipates the above limitation since the CT image acquisition is gated by ECG or EKG where ***the gating provides*** specific phase, in other words, ***marker in the ECG or EKG.***" Final Action Paper No. 26042005, page 2 (emphasis added).

The Examiner further asserts that the "Heuscher et al. device ***inherently discloses***" the above-noted limitation, and that "As stated above, the marker-in signal is disclosed" in Heuscher. Final Action Paper No. 26042005, page 2 (emphasis added).

In the first instance, the Examiner relies on an inherency argument to allege that the exposure marker-in signal is disclosed in Heuscher, without showing with specificity where Heuscher ***necessarily*** includes the claimed ***exposure marker-in signal that is communicated to the electrocardiogram device.*** For an inherency argument to stand, the Examiner must show that Heuscher ***necessarily*** includes all of the claimed limitations. "[A] prior art reference may anticipate without disclosing a feature of the claimed invention if that characteristic is ***necessarily*** present, or inherent, in the single anticipating reference." *Toro Co. v. Deere & Co.*, 355 F.3d 1313, 1320, 69 USPQ2d 1584, 1590 (Fed. Cir. 2004) (emphasis added) (citing *Schering Corp. v. Geneva Pharmaceuticals, Inc.*, 339 F.3d 1373, 1377, 67 USPQ2d 1664, 1668 (Fed. Cir. 2003)). If the Examiner contends that a gated EKG signal (communication ***from*** an EKG device ***to*** a CT scanner) is inherently the same as the claimed exposure marker-in signal that is

communicated to the electrocardiogram device (communication ***from*** a CT scanner ***to*** an EKG device), Appellants first respectfully submit that the Heuscher communication is in the ***opposite direction*** to the claimed communication, and then respectfully submit that the Examiner has not shown where Heuscher ***necessarily*** includes the claimed limitation of communicating ***an exposure marker-in signal from*** a CT scanner ***to*** an EKG device. Accordingly, Appellants submit that the Examiner has not met the burden of a showing of inherency, and for at least this reason, Appellants respectfully request withdrawal of the anticipation rejection under 35 U.S.C. §102(b) and allowance of the claims.

In the second instance, the Examiner has not shown with specificity where Heuscher discloses both an ***exposure marker-in signal***, as claimed, and ***communication of the exposure marker-in signal to the electrocardiogram device***.

At Paragraph [0025], Appellants define ***an exposure marker-in signal 228*** to be an event signal that is ***generated by the CT imaging system 4*** and ***communicated to the EKG monitoring device*** 2 so as to overlay the EKG waveform data 200 and indicate the start of a CT scan.

Here, Appellants act as their own lexicographer to specifically define an exposure marker-in signal 228 to be an event signal that originates from the imaging system and that is communicated to the EKG monitoring device. As such, an exposure marker-in signal 228 is not the same as an EKG-gated signal that is communicated to a CT imaging system.

Viewed another way, an exposure marker-in signal 228 is a visual marker communicated to and displayed at the EKG monitoring device that signals an event at the CT imaging system, thereby providing "handshake" feedback to the EKG monitoring device to signify that an exposure event has been initiated at the CT imaging system. See Figure 4 and Paragraph [0025]. The benefit of such feedback and visual display at the EKG monitoring device is improved correlation between CT image data and EKG monitoring data, as discussed at Paragraphs [0004], [0026] and [0030] of the specification, for example.

At column 1, lines 65-66, Heuscher discloses that the Heuscher invention contemplates a new and improved cardiac gated spiral CT imaging apparatus and technique.

At the Abstract, and column 2, lines 18-20, Heuscher discloses that the ECG data is used to accurately correlate phases of the patient's heart with data collected by the radiation detectors.

At column 2, lines 13-15 and 27-30, and column 2 line 62 through column 3 line 8, Heuscher discloses that a patient-specific scan protocol, in response to measured patient

characteristics and scanner characteristics, is selected and used to perform a spiral CT scan while collecting ECG data from the patient, and that the ECG data is used to correlate phases of the patient's heart with x-ray data collected via the spiral CT scan.

At column 2, lines 26-30, Heuscher discloses that the measured patient characteristics include one or more of those selected from the group consisting of average patient heart rate, patient breath hold time, and range of scan coverage in the z direction based on patient anatomy.

At column 3, lines 39-41, Heuscher discloses that one advantage of the present [Heuscher] invention is that it provides ***a versatile and selectable protocol for cardiac gated spiral CT imaging which is patient-specific***. Emphasis added.

In contrast with the claimed invention, Appellants find Heuscher to be directed to cardiac-gated spiral CT imaging using a patient-specific scan protocol, where the ECG data is used to correlate heart data with image data, and ***not to include communicating an exposure marker-in signal***, as defined by Appellants specification, ***to an electrocardiogram device***, as specifically claimed for in the instant invention.

In comparing Heuscher with the claimed invention, Appellants submit that the Examiner has failed to show where Heuscher discloses ***an exposure marker-in signal, as defined by Appellants specification***. For at least this reason, Appellants respectfully submit that the Examiner has failed to show where Heuscher discloses each and every element of the claimed invention, and therefore request withdrawal of the anticipation rejection under 35 U.S.C. §102(b) and allowance of the claims.

In response to Appellants assertion that Heuscher does not disclose ***communicating an exposure marker-in signal <u>to</u> said electrocardiogram device***, the Examiner alleges that "Heuscher et al. ***clearly*** anticipates this limitation since the CT control ***monitors the ECG or EKG data***, i.e. communicates with ECG or EKG to obtain the phase information of the patient ***to control the CT scanning...***". Final Action Paper No. 26042005, pages 2-3 (emphasis added).

In the Advisory Action Paper No. 24072005, page 1, the Examiner states under Paragraph 11: "Examiner would like to also point out that, in regard to the remarks, the 'exposure marker-in signal communication' is ***clearly*** met by the reference cited in the previous office action. The ***motivation*** for using cardiac cycle with ECG or EKG waveform is to obtain images at the same peak waveform for the cardiac cycle to reduce motion artifacts. ***Thus, the exposure of CT image acquisition at the ECG or EKG gated control is identical to the claimed***

invention in the current application." (Emphasis added).

In alleging anticipation, the Examiner appears to use a "***motivation***" argument "for using cardiac cycle with ECG or EKG waveform...", and then alleges that monitoring the EKG data and controlling the CT scanning is sufficient to "***clearly***" anticipate the claimed limitation of ***communicating an exposure marker-in signal to said electrocardiogram device*** because it is (allegedly) ***identical*** to the claimed invention. By alleging, through a "***motivation***" argument, that ***monitoring EKG data*** in combination with a communication ***to control the CT scanning*** is sufficient to anticipate the claimed invention, and therefore is the same as ***communicating an exposure marker-in signal to said electrocardiogram device***, the Examiner not only appears to be far over-reaching in his interpretation of Heuscher, but also appears to be applying a non-obviousness argument for purposes of anticipation.

Contrary to the Examiner's allegation, Appellants find Heuscher to disclose communication of measured patient characteristics to a look-up table that correlates this information with a patient-specific scan protocol (column 2, lines 31-35), and then communication of the patient-specific scan protocol to a spiral CT scanner (column 2, line 62 through column 3, line 3). As such, Appellants do not find Heuscher to disclose ***communicating an exposure marker-in signal to said electrocardiogram device.***

Appellants fail to appreciate how ***the communication of EKG data to control CT scanning*** (communication ***from*** the EKG device ***to*** the CT scanner), as disclosed in Heuscher, is the same as, and therefore anticipates (allegedly), ***communicating an exposure marker-in signal to said electrocardiogram device*** (communication ***from*** the CT scanner ***to*** the EKG device), as claimed in the instant invention. Appellants also fail to appreciate how ***the exposure of CT image acquisition at the ECG or EKG gated control*** is identical to (allegedly) ***communicating an exposure marker-in signal to said electrocardiogram device***. Appellants submit that the communication in Heuscher is in the ***opposite direction*** from the communication in the instant invention. For at least these reasons, Appellants respectfully submit that the Examiner has failed to show where Heuscher discloses each and every element of the claimed invention arranged as claimed, and therefore request withdrawal of the anticipation rejection under 35 U.S.C. §102(b) and allowance of the claims.

Claims 7 and 18

Claims 7 and 18 are dependent claims that further include the limitation of:

"...wherein said communicating includes introducing said exposure marker-in signal to said electrocardiogram device ***so as to associate said exposure marker-in signal with the start of a computed tomography imaging system scan***."

In alleging anticipation, the Examiner has not only failed to show where Heuscher discloses ***an exposure marker-in signal***, defined in the specification as ***an event signal that originates from the imaging system and that is communicated to the EKG monitoring device***, but has also failed to show where Heuscher ***associates the exposure marker-in signal***, as defined, ***with the start of a computed tomography imaging system scan***.

While Heuscher may disclose EKG gated spiral CT imaging (communication from an EKG device to a CT scanner), Appellants submit that such disclosure is not the same as ***communicating an exposure marker-in signal to said electrocardiogram device*** (communication from a CT scanner to an EKG device) ***so as to associate the exposure marker-in signal with the start of a CT imaging system scan***.

For at least this reason, Appellants respectfully submit that the Examiner has failed to show where Heuscher discloses each and every element of the claimed invention arranged as claimed, and therefore request withdrawal of the anticipation rejection under 35 U.S.C. §102(b) and allowance of the noted claims.

Claims 10 and 20

Claims 10 and 20 are dependent claims that further include the limitation of:

"...wherein said ***exposure marker-in signal is responsive to said computed tomography imaging system***."

In alleging anticipation, the Examiner has not only failed to show where Heuscher discloses ***an exposure marker-in signal***, defined in the specification as ***an event signal that originates from the imaging system and that is communicated to the EKG monitoring device***, but has also failed to show where Heuscher discloses that the ***exposure marker-in signal***, as defined, ***is responsive to the computed tomography imaging system***.

While Heuscher may disclose EKG gated spiral CT imaging (communication from an EKG device to a CT scanner), Appellants submit that such disclosure is not the same as ***communicating an exposure marker-in signal to said electrocardiogram device*** (communication from a CT scanner to an EKG device) wherein said ***exposure marker-in signal is responsive to said computed tomography imaging system***.

For at least this reason, Appellants respectfully submit that the Examiner has failed to show where Heuscher discloses each and every element of the claimed invention arranged as claimed, and therefore request withdrawal of the anticipation rejection under 35 U.S.C. §102(b) and allowance of the noted claims.

Claim 29

Claim 29 is a dependent claim that further includes the limitation of:

"...said generated ***exposure marker-in signal represents a computed tomography event signal***...".

In alleging anticipation, the Examiner has not only failed to show where Heuscher discloses ***an exposure marker-in signal***, defined in the specification as ***an event signal that originates from the imaging system and that is communicated to the EKG monitoring device***, but has also failed to show where Heuscher discloses that the ***exposure marker-in signal***, as defined, ***represents a computed tomography event signal***.

While Heuscher may disclose EKG gated spiral CT imaging (communication from an EKG device to a CT scanner), Appellants submit that such disclosure is not the same as ***communicating an exposure marker-in signal to said electrocardiogram device*** (communication from a CT scanner to an EKG device) wherein said generated ***exposure marker-in signal represents a computed tomography event signal***.

For at least this reason, Appellants respectfully submit that the Examiner has failed to show where Heuscher discloses each and every element of the claimed invention arranged as claimed, and therefore request withdrawal of the anticipation rejection under 35 U.S.C. §102(b) and allowance of the noted claims.

In summary, Claims 1-30 are patentable over the art of record, alternatively, Claims 7 and 18 are patentable over the art of record, alternatively, Claims 10 and 20 are patentable over the art of record, and alternatively, Claim 29 is patentable over the art of record. For the reasons cited above, Appellants respectfully submit that all of the claims are allowable and the application is in condition for allowance. Appellants respectfully request reversal of the outstanding rejections and allowance of this application.

In the event the Examiner has any queries regarding the submitted arguments, the undersigned respectfully requests the courtesy of a telephone conference to discuss any matters in need of attention.

If there are any additional charges with respect to this Appeal Brief, please charge them to Deposit Account No. 07-0845.

Respectfully submitted,

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VIII. CLAIMS APPENDIX

1. A method for associating EKG waveform data with computed tomography image data using a data synchronization scheme comprising:

generating the EKG waveform data using an electrocardiogram device;

operating a computed tomography imaging system so as to create the computed tomography image data;

communicating an exposure marker-in signal to said electrocardiogram device such that said exposure marker-in signal is associated with the EKG waveform data; and

processing the computed tomography image data, the EKG waveform data and said exposure marker-in signal, so as to correlate the EKG waveform data with the computed tomography image data.

2. The method of claim 1, wherein said generating includes operating said electrocardiogram device so as to create the EKG waveform data, wherein the EKG waveform data is responsive to the cardiac function of a patient.

3. The method of claim 1, wherein said generating includes generating and introducing an event signal to said electrocardiogram device so as to overlay the EKG waveform data with said event signal such that said event signal is associated with the EKG waveform data.

4. The method of claim 1, wherein said communicating an exposure marker-in signal includes generating and introducing said exposure marker-in signal so as to overlay the EKG waveform data with said exposure marker-in signal.

5. The method of claim 1, wherein said electrocardiogram device includes a marker-in input and wherein said electrocardiogram device is communicated with a patient.

6. The method of claim 1, wherein said communicating includes introducing an event signal to said electrocardiogram device so as to associate said event signal with an R-peak event.

7. The method of claim 1, wherein said communicating includes introducing said exposure marker-in signal to said electrocardiogram device so as to associate said exposure marker-in signal with the start of a computed tomography imaging system scan.

8. The method of claim 1, wherein the EKG waveform data includes an R-Peak event, an atrial depolarization event and a ventricular re-polarization event.

9. The method of claim 1, wherein said generating includes generating an event signal responsive to the EKG waveform data.

10. The method of claim 1, wherein said exposure marker-in signal is responsive to said computed tomography imaging system.

11. The method of claim 1, wherein said processing includes processing the computed tomography image data, the EKG waveform data and said exposure marker-in signal so as to associate the EKG waveform data with the computed tomography image data.

12. The method of claim 1, wherein said processing includes storing the computed tomography image data, the EKG waveform data and said exposure marker-in signal using a data storage device.

13. A medium encoded with a machine-readable computer program code for associating EKG waveform data with computed tomography image data using a data synchronization scheme, said medium including instructions for causing a controller to implement a method comprising:

generating the EKG waveform data using an electrocardiogram device;

operating a computed tomography imaging system so as to create the computed tomography image data;

communicating an exposure marker-in signal to said electrocardiogram device such that said exposure marker-in signal is associated with the EKG waveform data; and

processing the computed tomography image data, the EKG waveform data and said exposure marker-in signal, so as to correlate the EKG waveform data with the computer tomography image data.

14. The medium of claim 13, wherein said generating includes operating said electrocardiogram device so as to create the EKG waveform data, wherein the EKG waveform data is responsive to the cardiac function of a patient.

15. The medium of claim 13, wherein said generating includes generating and introducing an event signal to said electrocardiogram device so as to overlay the EKG waveform data with said event signal such that said event signal is associated with the EKG waveform data

16. The medium of claim 13, wherein said communicating an exposure marker-in signal includes generating and introducing said exposure marker-in signal so as to overlay the EKG waveform data with said exposure marker-in signal.

17. The medium of claim 13, wherein said communicating includes introducing an event signal to said electrocardiogram device so as to associate said event signal with an R-peak event.

18. The medium of claim 13, wherein said communicating includes introducing said exposure marker-in signal to said electrocardiogram device so as to associate said exposure marker-in signal with the start of a computed tomography imaging system scan.

19. The medium of claim 13, wherein said generating includes generating an event signal responsive to the EKG waveform data.

20. The medium of claim 13, wherein said exposure marker-in signal is responsive to said computed tomography imaging system.

21. The medium of claim 13, wherein said processing includes processing the computed tomography image data, the EKG waveform data and said exposure marker-in signal so as to associate the EKG waveform data with the computed tomography image data.

22. The medium of claim 13, wherein said processing includes storing the computed tomography image data, the EKG waveform data and said exposure marker-in signal using a data storage device.

23. A method for associating EKG waveform data with image data generated by an imaging system using a data synchronization scheme comprising:

obtaining the imaging system, an electrocardiogram device and an object to be examined;

associating said object with the imaging system and said electrocardiogram device; and

processing the image data and the EKG waveform data using the data synchronization scheme wherein the data synchronization scheme,

generates the EKG waveform data using an electrocardiogram device;

operates the imaging system so as to create the image data;

communicates an exposure marker-in signal to said electrocardiogram device such that said exposure marker-in signal is associated with the EKG waveform data; and

processes the image data, the EKG waveform data and said exposure marker-in signal, so as to correlate the EKG waveform data with the image data.

24. A system for associating EKG waveform data with computed tomography image data using a data synchronization scheme comprising:

a gantry having an x-ray source and a radiation detector array, wherein said gantry defines an object cavity and wherein said x-ray source and said radiation detector array are rotatingly associated with said gantry so as to be separated by said object cavity;

an object support structure movingly associated with said gantry so as to allow communication with said object cavity; and

a processing device having the data synchronization scheme, wherein the data synchronization scheme,

generates the EKG waveform data using an electrocardiogram device;

operates a computed tomography imaging system so as to create the computed tomography image data;

communicates an exposure marker-in signal to said electrocardiogram device such that said exposure marker-in signal is associated with the EKG waveform data; and

processes the computed tomography image data, the EKG waveform data and said exposure marker-in signal, so as to correlate the EKG waveform data with the computer tomography image data.

25. A system for associating EKG waveform data with image data using a data synchronization scheme comprising:

an imaging system;

an object disposed so as to be communicated with said imaging system, wherein said imaging system generates image data responsive to said object; and

a processing device having the data synchronization scheme, wherein the data synchronization scheme,

generates the EKG waveform data using an electrocardiogram device;

operates said imaging system so as to create the image data;

communicates an exposure marker-in signal to said electrocardiogram device such that said exposure marker-in signal is associated with the EKG waveform data; and

processes the image data, the EKG waveform data and said exposure marker-in signal, so as to correlate the EKG waveform data with the image data.

26. The system of claim 25, wherein said object is a patient.

27. The system of claim 25, wherein said imaging system is a computed tomography imaging system.

28. The method of claim 1, further comprising:

operating the computed tomography imaging system so as to generate an exposure mark-in signal; and

wherein said communicating an exposure marker-in signal to said electrocardiogram device comprises communicating said generated exposure marker-in signal to said electrocardiogram device.

29. The method of claim 28, wherein:

said generated exposure marker-in signal represents a computed tomography event signal; and

said communicated exposure marker-in signal is communicated so as to overlay the EKG waveform data and indicate the start of a CT scan.

30. The system of claim 24, wherein the data synchronization scheme further,

operates the computed tomography imaging system so as to generate an exposure marker-in signal; and

communicates the generated exposure marker-in signal to said electrocardiogram device such that the generated exposure marker-in signal is associated with the EKG waveform data.

IX. EVIDENCE APPENDIX

There is no evidence submitted pursuant to 37 C.F.R. §1.130, 37 C.F.R. §1.131, or 37 C.F.R. §1.132 or any other evidence entered by the Examiner and relied upon by the Appellant in this appeal, known to the Appellants, Appellants' legal representatives, or assignee.

X. RELATED PROCEEDING APPENDIX

There are no other related appeals or interferences known to Appellants, Appellants' legal representatives, or assignee that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.